applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

B1 cont.

separating the DNA sample into fragments along the migration channel within the buffer;

detecting fluorescent light emitted from the fragments along the migration channel; and,

generating a full image of the separation apparatus and the separated DNA fragments in a single scan pass.

7. (Amended) A method of sequencing DNA fragments comprising:

placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;

applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

B2

separating the DNA sample into fragments along the migration channel within the buffer;

detecting fluorescent light emitted from the fragments along the migration channel using an amorphous silicon two-dimensional image sensor array and,

generating a full image of the separation apparatus and the separated DNA fragments.

9. (Twice Amended)An apparatus for the sequencing of DNA comprising:

a separation apparatus having a plurality of migration channels

B3

operative to receive a DNA sample and facilitate migration and separation into fragments of the DNA sample along a migration channel within the apparatus;

a detector operative to detect light emitted from DNA fragments along the migration channels; and,

an image processor operative to generate image data representing a full image of the separation apparatus and the DNA fragments in a single scan pass.

B4

13. (Amended) An apparatus for the sequencing of DNA comprising:

a separation apparatus having a plurality of migration channels operative to receive a DNA sample and facilitate migration and separation into fragments of the DNA sample along a migration channel within the apparatus;

a two-dimensional amorphous silicon image sensor array detector operative to detect light emitted from DNA fragments along the migration channels; and,

an image processor operative to generate image data representing a full image of the separation apparatus and the DNA fragments.

B5

14. (Twice Amended) A system for sequencing DNA fragments comprising:

means for placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;

means for applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

means for separating the DNA sample into fragments along the migration channel within the buffer;

means for illuminating the DNA fragments;

means for detecting fluorescent light emitted from the illumination fragments along the migration channel; and,

means for generating a full image of the separation apparatus and the separated DNA fragments in a single scan pass.

B6

16. (Amended) A system for sequencing DNA fragments comprising:

means for placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;

means for applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

means for separating the DNA sample into fragments along the migration channel within the buffer;

means for illuminating the DNA fragments;

B6 cont.

an amorphous silicon two-dimensional image sensor array for detecting fluorescent light emitted from the illumination fragments along the migration channel; and,

means for generating a full image of the separation apparatus and the separated DNA fragments.

20. (Amended) A system for sequencing DNA fragments comprising:

means for placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;

B7

means for applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

means for separating the DNA sample into fragments along the migration channel within the buffer;

a laser attached to the rear of the detecting means for illuminating the DNA fragments;

means for detecting fluorescent light emitted from the illumination fragments along the migration channel; and,

means for generating a full image of the separation apparatus and the separated DNA fragments.

Please add the following new claims:

21. (New) The method of claim 7 wherein the buffer is a gel.

B8

22. (New) The method of claim 7 wherein the buffer is a polymer solution.

23. (New) The method of claim 7 wherein the separation apparatus comprises a plurality of capillary tubes forming the migration channels.

24. (New) The method of claim 7 wherein the separation apparatus comprises a set of glass plates with lithographically etched channels forming the migration channels.

25. (New) The apparatus of claim 13 wherein the separation apparatus comprises:

at least on capillary tube;

a buffer; and,

a means for providing an electric field to create a bias between ends of the capillary tube.

26. (New) The apparatus of claim 13 wherein the separation apparatus comprises:

a stacked pair of lithographically etched glass plates;

a buffer; and,

a means for providing an electric field to create a bias between ends of the glass plates.

The Office Action:

In the Office Action mailed on October 16, 2002, the Examiner rejected claims 1-3, 6, 9, 12, 14, 15, 17, and 18 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,246,866 to Nasu et al.

Claims 5 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nasu in view of U.S. Patent No. 5,637,458 to Frankel et al.

The Examiner also rejected claims 1-4, 6, 8-10, 12, 14, 15, and 18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,274,240 to Mathies et al. in view of U.S. Patent No. 5,627,643 to Birnbaum et al.

Claim 19 was rejected under 35 U.S.C. §103(a) as being unpatentable over Mathies et al. in view of Birnbaum et al and in further view of U.S. Patent No. 6,136,612 to Della Ciana et al.

The Examiner indicated that claims 7, 13, 16, and 20 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Claims 1-20 remain pending in the application.